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Abyssal origin for the early Holocene pulse of unradiogenic neodymium isotopes in Atlantic seawater

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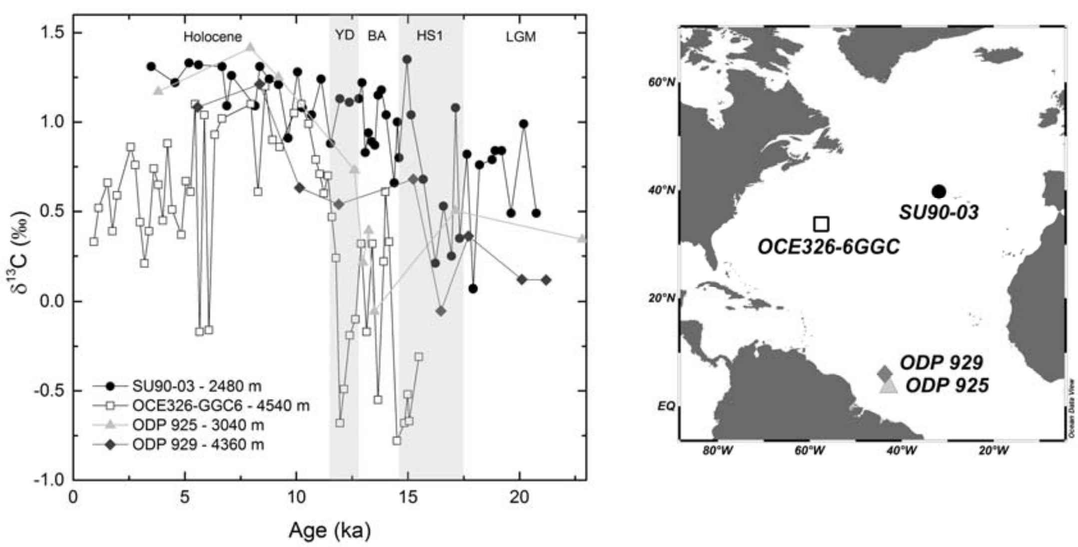
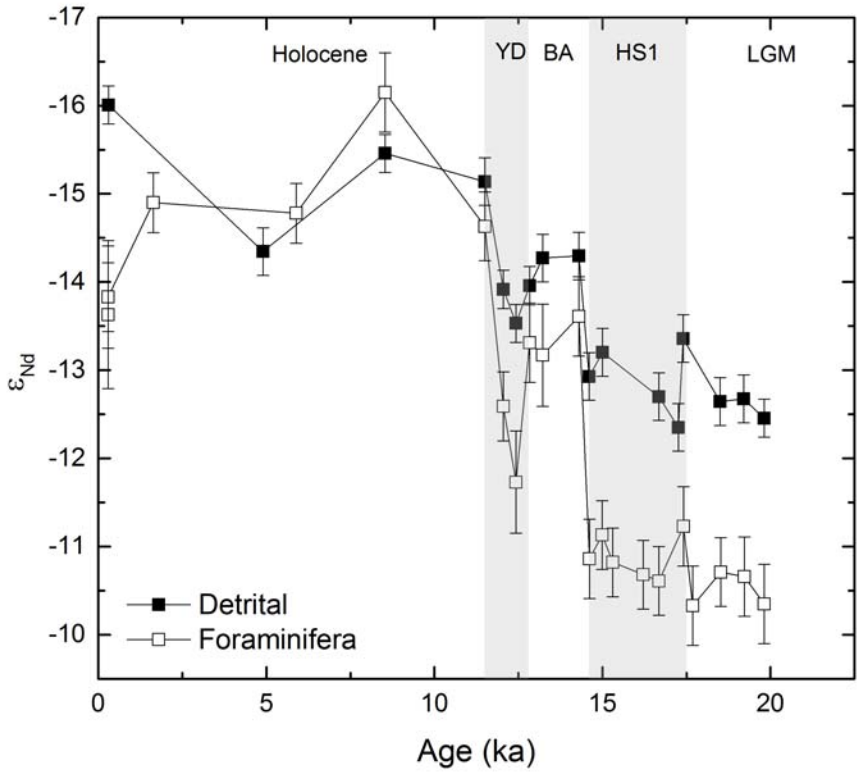
Supplementary Information:



Supplementary Figure DR1. (Left) Benthic foraminiferal $\delta^{13}C$ records from SU90-03 (Chapman and Shackleton, 1998), ODP 925 and ODP 929 (Bickert et al., 1997) and OCE326-GGC6 (Boyle and Keigwin, 1987). **(Right)** Map showing core locations (Schlitzer, 2016).



Supplementary Figure DR2: Detrital and foraminiferal neodymium isotopes from OCE326-GGC6 on the Bermuda Rise (Roberts et al., 2010; Roberts, 2012).

References

Bickert, T., Curry, W., and Wefer, G., 1997, Late Pliocene to Holocene (2.6-0 Ma) western equatorial Atlantic deep-water circulation: Inferences from benthic stable isotopes: Proceedings of the Ocean Drilling Program, Scientific Results, v. 154, p. 239–254.

Boyle, E.A., and Keigwin, L.D., 1987, North Atlantic thermohaline circulation during the past 20,000 years linked to high-latitude surface temperature: Nature, v. 330, no. 6143, p. 35–40.

Chapman, M.R., and Shackleton, N.J., 1998, Millennial-scale fluctuations in North Atlantic heat flux during the last 150,000 years: Earth and Planetary Science Letters, v. 159, no. 1-2, p. 57–70.

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Roberts, N.L., Piotrowski, A.M., McManus, J.F., and Keigwin, L.D., 2010, Synchronous deglacial overturning and water mass source changes.: Science (New York, N.Y.), v. 327, no. 5961, p. 75–78, doi: 10.1126/science.1178068.

Schlitzer, R., 2016, Ocean Data View:.

Table DR1

SU90-03 (40.0°N, 32.0°W, 2480 m)

Depth (cm)	Age (ka)	εNd	2σ
5	4.6	-12.45	0.13
17	7.1	-12.86	0.17
22	8.2	-13.41	0.20
25	8.8	-13.13	0.21
29	9.6	-13.38	0.17
31	10.1	-13.27	0.13
32	10.3	-13.49	0.50
36	11.1	-13.35	0.17
38	11.5	-12.77	0.34
40	12.0	-13.03	0.13
42	12.4	-12.76	0.29
44	12.8	-13.02	0.17
48	13.1	-13.55	0.25
50	13.2	-13.46	0.24
58	13.8	-12.74	0.17
66	14.4	-12.09	0.13
71	15.0	-11.69	0.17
78	16.2	-11.81	0.15
82	17.0	-11.94	0.09
86	17.6	-10.25	0.17
88	17.9	-11.20	0.16
92	18.5	-11.14	0.16
95	18.9	-10.71	0.16
97	19.2	-10.98	0.12
104	20.2	-10.82	0.12
107	20.6	-10.87	0.11
112	21.3	-10.97	0.11
117	22.0	-10.84	0.23

Table DR2

ODP 925E (4.2°N, 43.5°W, 3040 m)

Depth (cm)	Age (ka)	εNd	2σ
8	3.8	-12.53	0.17
18	7.9	-13.61	0.59
21	9.2	-13.68	0.20
24	10.0	-13.61	0.20
28	11.1	-13.22	0.31
31	11.8	-12.29	0.26
34	12.6	-11.48	0.26
38	13.0	-11.38	0.22
41	13.2	-11.01	0.26
44	13.5	-11.01	0.26
48	13.9	-10.94	0.22
53	14.5	-10.32	0.26
58	15.2	-10.04	0.22
63	17.1	-9.90	0.26
68	19.0	-9.78	0.26
78	22.8	-10.00	0.26

Table DR3

ODP 929B (6.0°N, 43.7°W, 4360 m)

Depth (cm)	Age (ka)	εNd	2σ
3	5.6	-12.07	0.17
8	7.0	-12.06	0.34
13	8.4	-12.69	0.26
18	10.1	-12.09	0.23
23	11.9	-11.30	0.22
28	12.9	-11.05	0.21
33	13.9	-10.40	0.31
38	15.2	-10.14	0.34
43	16.5	-9.52	0.20
48	17.7	-9.60	0.34
53	19.0	-9.19	0.22
58	20.1	-9.20	0.32
63	21.2	-9.21	0.20

Table DR4

Core	**Latitude (°N)**	**Longitude (°E)**	**Depth (m)**	**Age (ka)**	**Peak early Holocene εNd**	**2s**
BOFS 17K	58	-16.5	1150	5.8	-13.4	0.5
BOFS 11K	55.2	-20.4	2004	6.4	-14.0	0.5
BOFS 10K	54.7	-20.7	2777	6.9	-14.4	0.5
BOFS 5K	50.7	-21.9	3547	6.7	-13.6	0.3
BOFS 8K	52.5	-22.1	4045	6.4	-14.5	0.3
MD01-2454G	55.5	-15.7	747	7.7	-15.4	0.4
12JPC	29.1	-72.9	4250	8.8	-14.3	0.2
SU90-03	40	-32	2480	10.3	-13.5	0.5
ODP 925E	4.2	-43.5	3040	9.2	-13.7	0.2
ODP 929B	6	-43.7	4360	8.4	-12.7	0.3
OCE326 GGC6	33.7	-57.6	4540	8.5	-16.2	0.5
U1313	41	-33	3426	8.8	-14.59	0.2
GeoB1523-1	3.8	-41.6	3292	6.5	-13.48	0.2
GeoB1515-1	4.2	-43.7	3129	4.4	-13.3	0.2

Reference
Roberts & Piotrowski, EPSL, 2015
Roberts & Piotrowski, EPSL, 2015
Roberts & Piotrowski, EPSL, 2015
Roberts & Piotrowski, EPSL, 2015
Roberts & Piotrowski, EPSL, 2015
Colin et al., QSR, 2010
Gutjahr et al., EPSL, 2008
This work
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This work
Roberts et al., Science, 2010
Lippold et al., EPSL, 2016
Lippold et al., EPSL, 2016
Lippold et al., EPSL, 2016

Table DR5

	Depth (cm)	ID	^{14}C Age (yrs)	Sds (σ)	Species	Calibration Curve
ODP 925E						
1	8-10	SUERC-53665	3835	37	*G. sacculifer*	Marine13
2	21-22	SUERC-53666	8572	38	*G. sacculifer*	Marine13
3	34-35	SUERC-53667	11099	40	*G. sacculifer*	Marine13
4	48-50	SUERC-53668	12374	41	*G. sacculifer*	Marine13
5	58-60	SUERC-53669	13120	42	*G. sacculifer*	Marine13
6	78-80	SUERC-53670	19390	68	*G. sacculifer*	Marine13
7	118-120	SUERC-53671	27650	161	*G. sacculifer*	Marine13
ODP 929B						
1	3-5	SUERC-53678	5211	37	*G. sacculifer*	Marine13
2	13-15	SUERC-53679	7870	36	*G. sacculifer*	Marine13
3	23-25	SUERC-53680	10604	38	*G. sacculifer*	Marine13
4	33-35	SUERC-53681	12457	41	*G. sacculifer*	Marine13
5	53-55	SUERC-53684	16138	52	*G. sacculifer*	Marine13
6	83-85	SUERC-53685	21673	84	*G. sacculifer*	Marine13
7	113-115	SUERC-53686	27296	156	*G. sacculifer*	Marine13